



**CALIFORNIA STATE SCIENCE FAIR  
2003 PROJECT SUMMARY**

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| <b>Name(s)</b><br><b>Jeffrey B. Kim</b>   | <b>Project Number</b><br><b>S1513</b> |
| <b>Project Title</b><br><b>The Effect of Weighted Force on Fluorescence Emission of Methyl Salicylate through Triboluminescence</b>   |                                       |
| <b>Abstract</b>   |                                       |
| <b>Objectives/Goals</b><br>My objective is to use the imprinted fluorescence emission of methyl salicylate on Kodak Ektachrome (EL) color film negatives to determine the frequency and wavelength in comparison with data collected from a computer.   |                                       |
| <b>Methods/Materials</b><br>A weight, with the distance of three centimeters from the substance was used to create the breakage of the crystals.<br>The light sensor, which is optional, is placed ten centimeters from the substance to record intensity of brightness. With the bluish glow sub sighting, the negatives were developed so proper measurements could be taken. The focal point at which the intensity was greatest was the center of the area with the lightest color of blue. Using a measurement of centimeters, the developed negatives were measured from the focal point to the furthest part of imprint that is visible. The distance of the weight from the substance was increased one and a half centimeters. The increase was stopped after four different distances.  |                                       |
| <b>Results</b><br>The negatives with the imprints of the fluorescence emission of the substance were developed and measurements were taken from the focal point to the furthest edge of coloration. This data and the usage of Professor Linda M. Sweeting's conversion table helped create the estimated graph in which allowed for the determining of the frequency and wavelength.   |                                       |
| <b>Conclusions/Discussion</b><br>The hypothesis for the experimentation using the imprinted fluorescence emission of the substance on the negatives to determine the frequency and wavelength to suspect change, states that the weighted force will not affect the outcome at which the frequency and wavelength of the imprinted fluorescence emission of the substance will receive very little or no change at all. Through experimentation, the hypothesis was inconclusive. The primary goal was reached in which finding an alternate way of determining triboluminescence based only on imprinted negatives but method of measuring was all estimation. Calculating the percent deviation has proven that the estimations that were made were in fact close to the real thing. The idea of measuring out the focal point to the end of coloration served as a backbone to the results.<br>Many obstacles were faced when testing out the hypothesis. For example, the size of the negatives was not taken into consideration. Even after developing the negatives, there was no possible way of estimating the focal point precisely. |                                       |
| <b>Summary Statement</b><br>Taking methyl salicylate, force is put upon the substance creating a fluorescence emission using the process of triboluminescence in which leaves an imprint on the color film negative in order to determine wavelength and frequency.   |                                       |
| <b>Help Received</b>  |                                       |